

CLAIMS

1. A device for packaging products in a stretchable plastic film, comprising:
 - means for supporting one of the products to be packaged and for heating a lower abutment side of the products;
 - means for supplying the film from storage means in a position overlaying the product to be packaged;
 - means for clamping the film in the position overlaying the product to be packaged;
 - means for contacting the clamped film with the product to be packaged, in such a way as to adhere the film to the product in a stretched position;
 - means for cutting the film in stretched contact with the product along the product side that is still not connected to the film coming from the storage means;
 - means for releasing the cut film in stretched contact with the product;
 - means for bending the film under the product through a bending action on a whole lower perimeter of the product, the bending means allowing the film to adhere to the product on the product lower heated abutment side;
 - means for removing the product packaged in the film; and
 - control means for checking the operations of the device.
2. The device according to Claim 1, wherein the means for contacting the clamped film with the product to be packaged comprises at least one oscillating head with a basculating movement.
3. The device according to Claim 2, wherein the basculating movement of the head is manual.
4. The device according to Claim 2, wherein the basculating movement of the head is motored.
5. The device according to Claim 2, wherein the head comprises a bottom that has an opening for inserting the product to be packaged.
6. The device according to Claim 2, wherein the head further comprises means for adjusting the tension of the film on the product.
7. The device according to Claim 6, wherein the means for adjusting the tension

- of the film comprises at least one limit sensor whose detection position is adjustable along an axis of the head.
8. The device according to Claim 1, wherein the means for clamping the film comprises a pressing frame of the film that is hinged to the means for contacting the clamped film and is adapted to be oscillatingly opened and closed with respect to the means for contacting the clamped film.
 9. The device according to Claim 8, wherein the pressing frame of the film comprises means adapted to perform the locking of the film.
 10. The device according to Claim 9, wherein the means adapted to perform the locking of the film comprises an electromagnet placed integral with the basculating head and controlled by a feeler system of a limit sensor and by a related electric system, the electromagnet starting to operate when the packaging head starts to be lowered, a metallic abutment of the magnet integral with a lever connected to the pressing frame - fulcrum being attracted through an electric pulse onto the magnet making thereby the frame close and locking the plastic film with a force that is proportional to the electric current intensity operating on the magnet.
 11. The device according to Claim 8, wherein the pressing frame of the film comprises means for unlocking the film.
 12. The device according to Claim 11, wherein the means for unlocking the film comprises a spring that works under traction onto the frame and that, at the end of the electric current pulse on the magnet, takes back the frame to an opening position.
 13. The device according to Claim 1, wherein the means are adapted to realize an adjustment of the film tension on the product through an opening delay of the pressing frame due to electromechanical and electronic means activated by a limit sensor.
 14. The device according to Claim 1, wherein the means for cutting the film comprises at least one retractable hot blade for cutting the plastic film with possible adjustment of the film cutting along the film length.
 15. The device according to Claim 14, wherein the blade for cutting the plastic

film is protected by an oscillating screen and is arranged on an oscillating blade assembly.

16. The device according to Claim 15, wherein the screen and the blade assembly are oscillating on respective springs in order to perform a film cutting that is prolonged in time for a better cutting efficiency, when the head is lowered and presses the hot blade assembly.
17. The device according to Claim 14, wherein the blade for cutting the plastic film comprises heating means with electric resistance under direct current or with electric pulses.
18. The device according to Claim 14, wherein the blade for cutting the plastic film performs the film cutting with a mechanical knife.
19. The device according to Claim 14, wherein the blade for cutting the plastic film is placed on the means for contacting the clamped film.
20. The device according to Claim 1, wherein the means for supporting one of the products to be packaged and heating the product lower abutment side comprises at least one hot plane to rest thereon the product to be packaged, the hot plane comprises adjustable height and adjustable temperature.
21. The device according to Claim 1, wherein the means for supporting one of the products to be packaged are fixed with respect to the means for contacting the clamped film, the means for supporting one of the products to be packaged being displaced above the means for contacting the clamped film for laying the film above the product to be packaged.
22. The device according to Claim 1, wherein the means are moving with respect to the means for supporting one of the products to be packaged, the means for supporting one of the products to be packaged being lifted to push the product against the film being kept still by the means for contacting the claimed film.
23. The device according to Claim 1, the device further comprises a moving retractable abutment adapted to place the product to be packaged onto the means for supporting one of the products to be packaged.
24. The device according to Claim 23, wherein the moving retractable abutment is controlled by mechanical and electromechanical mechanisms that are activated

when the basculating packaging head is lowered.

25. The device according to Claim 1, wherein the means for bending the film under the product comprises packaging blades that are moving along an opposed alternate direction and simultaneously on the film.
26. The device according to Claim 1, wherein the means for bending the film under the product comprises packaging blades that are moving along an opposed alternate direction, not simultaneously, but ones delayed with respect to other ones.
27. The device according to Claim 25, wherein the packaging blades are overlapped in pairs, ones with respect to other ones.
28. The device according to Claim 25, wherein a movement of the blades is automatic and reciprocating, and is controlled by limit sensors.
29. The device according to Claim 25, wherein the blade is connected, by means of two oscillating arms and two rotating pins for each arm, to the blades that are longitudinally placed with respect to the head and transversally placed with respect to the blades.
30. The device according to Claim 1, further comprising means for parking the product that are adapted to keep the product still during packaging with the film.
31. The device according to Claim 1, wherein the means for supplying the film are of a manual type.
32. The device according to Claim 1, wherein the means for supplying the film comprises motored rotating rollers and jaws, the rollers being mutually connected through transmission belts, a ratio-motor assembly operating on the roller to operate the transmission belts placed on the packaging head sides, the transmission belts being connected to and driving and moving the jaws that are opened and closed through a mechanical system that operates on the jaws when they reach a translation point determined by limit sensors, the limit sensors, according to their position, making the jaws translate, the jaws catching and dragging the plastic film to perform the film insertion between the plane of the packaging head and the film pressing frame, the film catching movement of the

jaws automatically occurring when the packaging head is lifted in the head top stopped position.

33. The device according to Claim 1, wherein the means for contacting the clamped film are adapted to perform, in addition to the opening and closing movement through lifting and lowering, a basculating advancement and retreat movement with respect to a structure of the device, the movements of the means for contacting the clamped film facilitating the work of an operator.
34. The device according to Claim 33, wherein the means for contacting the clamped film are connected to shoulders through a toggle pin adapted to provide at one of the toggle pin ends a point fixed to the means for contacting the clamped film and at another of the toggle pin ends a pivot point rotating with the shoulders.
35. The device according to Claim 1, wherein the means for supporting and heating the product are adapted to slide along a basement of the device to facilitate the work of an operator.
36. The device according to Claim 35, wherein the means for supporting one of the products to be packaged slide onto the basement through sliding guides.
37. A process for packaging products in a stretchable plastic film using the device according to Claim 1, wherein the process comprises:
 - supporting and simultaneously heating one of the products to be packaged on a lower abutment side of the product;
 - supplying the film from storage means in a position overlaying the product to be packaged;
 - clamping the film in the position overlaying the product to be packaged;
 - contacting the clamped film with the product to be packaged, in such a way as to adhere the film to the product in a stretched position;
 - cutting the film in stretched contact with the product along the product side that is still not connected to the film coming from the storage means;
 - releasing the cut film in stretched contact with the product;
 - bending the film under the product through a bending action on a whole lower perimeter of the product, the bending step allowing the film to

- adhere to the product on the product lower heated abutment side by gluing together the four edges of the film; and
 - removing the product packaged in the film.
38. The process according to Claim 37, wherein contacting the clamped film with the product to be packaged is performed by keeping the product still and by placing above the product the clamped film.
 39. The process according to Claim 37, wherein contacting the clamped film with the product to be packaged is performed by keeping the clamped film still and by pushing the product against the clamped film.
 40. The process according to Claim 37, wherein contacting the clamped film with the product further comprises adjusting the film tension onto the product.
 41. The process according to Claim 37, wherein clamping the film further comprises adjusting the film locking pressure by adjusting the electric voltage on the magnet.
 42. The process according to Claim 37, wherein clamping the film further performing a film unlocking that is variable in time, with respect to the device cycle, with respect bending the film.
 43. The process according to Claim 37, wherein cutting the film is performed through cutting means and the process further comprises heating the cutting means before cutting the film.
 44. The process according to Claim 37, wherein the process further comprises placing the product in a prefixed packaging position after supporting the product.
 45. The process according to Claim 37, wherein bending the film under the product occurs simultaneously on all sides of the product.
 46. The process according to Claim 37, wherein bending the film under the product occurs firstly on two product sides and then on two other product sides opposed therewith.
 47. The process according to Claim 37, wherein the process further comprises pressing the product to keep the product still during packaging with the film.